

CLAIMS

Please Amend the Claims as Follows:

1. (Amended) A composition for controlled temperature induction heating comprising at least one matrix material and ferromagnetic electrically non-conductive hexagonal ferrite particles, and wherein the ferrite particles have a specific Curie temperature (T_c) in the matrix material and wherein the specific Curie temperature is substantially similar to a processing temperature of the matrix material.
2. (Amended) The composition of claim 1, wherein the ferromagnetic hexagonal ferrite particles are selected from the group consisting of ~~comprise~~ SrFe₁₂O₁₉, SrF, Me_a-2W, Me_a-2Y, and Me_a-2Z, wherein 2W is BaO:2Me_aO:8Fe₂O₃, 2Y is 2(BaO:Me_aO:3Fe₂O₃), and 2Z is 3BaO:2Me_aO:12Fe₂O₃, and wherein Me_a is a divalent cation.
3. (Original) The composition of claim 2, wherein the divalent cation is selected from Mg, Co, Mn and Zn.
4. (Original) The composition of claim 2, wherein the ferromagnetic hexagonal ferrite particles have the SrFe₁₂O₁₉, Co-2Y, Mg-2Y, Zn/Co-2Y, or Zn/Mg-2Y or combinations thereof.
5. (Original) The composition of claim 1, wherein the particles are on a surface of the matrix material.
6. (Original) The composition of claim 1, wherein the particles are embedded in the matrix material.
7. (Original) The composition of claim 1, wherein the Curie temperature is from about 100° to 450 °C.
8. (Original) The composition of claim 1, wherein the particles are from about 1 micron to about 840 microns.
9. (Original) The composition of claim 1, wherein the particles are less than 1 micron.

10. (Original) The composition of claim 1, wherein the particles are present from about 1% to about 50% by volume.
11. (Original) The composition of claim 11, wherein the particles are from about 10% to about 30% by volume.
12. (Original) The composition of claim 11, wherein the particles are present from about 15% to about 20% by volume.
13. (Original) The composition of claim 1, wherein the matrix material comprises a thermoplastic material.
14. (Amended) The composition of claim 13, wherein the thermoplastic material comprises poly(etheretherketone), polyetherketoneketone, poly(etherimide), polyphenylene sulfide, poly(sulfone), polyethylene terephthalate, PEEK, PEKK, PEL, PPS, PSU, PET, polyester, polyamide, polypropylene, polyurethane, polyphenylene oxide, polycarbonate, polypropylene/polyamide/nylon, polypropylene/ethylene vinyl alcohol, polyethylene PA, PP, PPA/MD6, PP/SEVOH, PE, PU, PPO, PC or combinations thereof.
15. (Original) The composition of claim 1, wherein T_c of the particles is less than the melting temperature of the matrix material.
16. (Original) The composition of claim 1, wherein T_c of the particles is greater than the melting temperature of the matrix material.
17. (Amended) A composition for controlled temperature induction comprising a matrix material and magnetically soft electrically non-conductive ferrite particles, wherein the particles have a specific Curie temperature (T_c) in the matrix material and wherein the specific Curie temperature is substantially similar to a processing temperature of the matrix material.
18. (Original) The composition of claim 17, wherein the particles have the composition $1M_{c_b}O:1Fe_2O_3$, where $M_{c_b}O$ is a transition metal oxide.
19. (Amended) The composition of claim 18, wherein the M_{c_b} is selected from Cu, Ni, Co, Mn, and Zn.

20. (Original) The composition of claim 18, wherein the matrix material comprises a thermoplastic material.

21. (Amended) The composition of claim 20, wherein the thermoplastic material comprises poly(etheretherketone), polyetherketoneketone, poly(etherimide), polyphenylene sulfide, poly(sulfone), polyethylene terephthalate, PEEK, PEKK, PEI, PPS, PSU, PET, polyester, polyamide, polypropylene, polyurethane, polyphenylene oxide, polycarbonate, polypropylene/polyamide/nylon, polypropylene/ethylene vinyl alcohol, polyethylene PA, PP, PP/MD6, PP/EVOH, PE, PU, PPO, PG or combinations thereof.

22. (Original) The composition of claim 17, wherein T_c of the particles is less than the melting temperature of the matrix material.

23. (Original) The composition of claim 17, wherein T_c of the particles is greater than the melting temperature of the matrix material.

24. (Original) The composition of claim 17, wherein the particles are selected from (Mn, ZnO) Fe_2O_3 and (Ni, ZnO) Fe_2O_3 .

Claims 25-77 (Canceled)

78. (Amended) A composite comprising a matrix and a susceptor included in the matrix for heating the matrix to a desired Curie temperature, wherein the specific Curie temperature is substantially similar to a processing temperature of the matrix material, wherein the susceptor comprises ferromagnetic, hexagonal electrically non-conductive ferrite particles having the composition $SrFe_{12}O_{19}$, SrF , Me_a-2W , Me_a-2Y , and Me_a-2Z , wherein $2W$ is $BaO:2Me_aO:8Fe_2O_3$, $2Y$ is $2(BaO:Me_aO:3Fe_2O_3)$, and $2Z$ is $3BaO:2Me_aO:12Fe_2O_3$, and wherein Me_a is a divalent cation, or magnetically soft ferrite particles having the composition $1Me_bO:1Fe_2O_3$, where Me_bO is a transition metal oxide.

79. (Original) The composite of claim 78, wherein the Curie temperature is changed by varying proportions of zinc in the composite.

80. (Original) The composite of claim 78, wherein the matrix comprises a thermoplastic material.

81. (Amended) The composite of claim 80, wherein the thermoplastic material comprises poly(etheretherketone), polyetherketoneketone, poly(etherimide), polyphenylene sulfide, poly(sulfone), polyethylene terephthalate, PEEK, PEKK, PEL, PPS, PSU, PET, polyester, polyamide, polypropylene, polyurethane, polyphenylene oxide, polycarbonate, polypropylene/polyamide/nylon, polypropylene/ethylene vinyl alcohol, polyethylene PA, PP, PPA, PBD, PEVOH, PE, PU, PPO, PC or combinations thereof.

82. (Original) The composite of claim 78, wherein Me_a comprises Mg, Co, Mn or Zn and Me_b comprises Ni, Co, Mn, or Zn.

Claims 83-101 (Canceled)

New Claims:

102. (New) The composition of claim 2, wherein the ferrite particles are selected from the group consisting of $SrFe_{12}O_{19}$, Co-2Y, Mg-2Y, Zn/Co-2Y, and Zn/Mg-2Y and wherein zinc is partially substituted for the divalent ions of the ferrite particles.

103. (New) The composition of claim 102, wherein zinc is about 15% substituted for the divalent ions of the ferrite particles.

104. (New) The composite of claim 78, wherein ferrite particles are selected from the group consisting of $SrFe_{12}O_{19}$, Co-2Y, Mg-2Y, Zn/Co-2Y, and Zn/Mg-2Y and wherein zinc is partially substituted for the divalent ions of the ferrite particles.

105. (New) The composite of claim 104, wherein zinc is about 15% substituted for the divalent ions of the ferrite particles.